and a Descemetocele is formed, then corneal transplantation becomes mandatory.

2. When a patient is unable to wear a contact lens for a practical amount of time.

3. When the tip of the cone becomes so opaque that vision is not good even with a contact lens.

The advisability of doing transplantation in the presence of one good eye is always debatable. However, in threatened rupture this is mandatory.

OPERATIVE COMPLICATIONS

Complications may be divided conveniently into those occurring in the immediate postoperative period, and those occurring in the late postoperative period.

In the first instance, namely the complications occurring in the early postoperative period, that most to be feared is incarceration or prolapse of the iris. This particular complication is very prone to occur in those cases having transplantation for conical cornea, inasmuch as a very large section of the cornea is transplanted. The iris is in very close proximity to the wound and it is easily incarcerated. This complication is a difficult one to treat, inasmuch as manipulation during the immediate postoperative period nearly always leads to a cloudy segment. It is better perhaps to leave these alone unless there is a frank prolapse, and to make a secondary repair at a later date. It is to be noted that in cases in which incarceration occurs, it is doubly necessary to use x-ray following hospitalization in order to prevent vascularization of the transplant. Although in the past infection has been a complication to be feared, under modern conditions this is no longer so important.

In the late postoperative period the common complications are opacification of the transplant and vascularization. For the former there is little to be done, but in the latter x-ray is very helpful. It has been my custom to use approximately 400 R in divided doses of 50 R each. Doses can be given about five days apart. Consoling to the surgeon is the fact that if opacification of the transplant occurs, a retransplant can always be done. It is necessary, however, that the new transplant exceed the old one in size.

GENERAL POSTOPERATIVE COURSE

It has been my practice to leave sutures in for at least ten days. Some have argued that the sutures might damage the new corneal epithelium, but I have not found this complication in any of my cases.

As has been noted in the motion picture it has been your speaker's custom to place an air bubble in the anterior chamber at the time of operation. This indicates clearly whether the transplant fits properly and acts as a cushion for pressure changes, and this should help to avoid the complication of iris incarceration.

Your speaker generally sends his patients home in two weeks and they wear a pressure bandage for about a week longer; and are under atropinization for approximately a month.

COMMENT

It is necessary that the technique of corneal transplantation in cases with conical cornea be particularly scrupulous, inasmuch as the cornea is so thin. Such thinness adds very considerably to the difficulties of cutting the cornea accurately. When the marking knife is used the cornea has a tendency to buckle and when the scissors are used a clean cut is difficult to make. In the operation done for corneal leucoma in which the cornea is of normal or greater than normal thickness, the procedure is relatively easy. Furthermore, in the conical cornea cases a large transplant is necessary in order that it may act as a support for the remaining portion of the cornea. The contrary is true in the corneal leucoma cases in which the cornea itself acts as a support for the transplant.

Following transplantation the question of the amount of astigmatism produced arises. In general, astigmatism is about of the same order as that found after cataract surgery, although in those cases that develop anterior synechiae the amount may be greater than normal, and at an odd axis.

It behooves opthalmologists on the Pacific Coast to familiarize themselves with this type of procedure and to make use of it. There will probably be a great number of patients with corneal leucoma coming back from the armed services, who will require corneal transplantation. Too, there are those with conical cornea who have threatened rupture, or who are unable to wear contact lenses, who should be given the privilege of having this type of surgery.

SUMMARY

A colored motion picture was demonstrated to show the technique of corneal transplantation in keratoconus by the Castroviejo technique. A discussion of some of the complications was presented. Colleagues were urged to make the use of this type of surgery more widespread.

727 West Seventh Street.

DEAFNESS—A MODERN APPROACH TO ITS TREATMENT

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IT might be said that in no other field of medicine more pessimism and "defeatism" is to be encountered than that which exists with regard to the treatment of deafness. The following pronouncements are examples of authentic statements by so-called authorities in the field of otology:

"Nothing can be done for deafness."

"The patient has nerve deafness, so there is no treatment."

"Your child is congenitally deafened and there is nothing that can be done. When he will be 5 or 6 years old, institutionalize him in a school for the deafened."

"We do not operate because of deafness."

"I can arrive at a diagnosis of deafness and tell whether my patients are improving without an audiogram."

ERRONEOUS STATEMENTS MAKE FOR PESSIMISTIC APPROACH

Fortunately, not one of these statements is true. But the disturbing fact remains that physicians in general and otologists in particular are so easily prepared to accept defeat in the treatment of deafness. Not even in the care and treatment of cancer patients has a comparable attitude of pessimism been allowed to become established almost without a challenge. But while cancer is notably a disease of old age, usually found in persons who have passed the prime of their active life, deafness is most harmful in childhood and youth. Moreover, the number of persons suffering from deafness is much larger than the number of cancer patients. It would, therefore, be no more than a socially and economically logical procedure to institute the most comprehensive research for the study and treatment of deafness. There is a great need for a few heavily endowed institutions with the sole purpose of furthering the research and advancing the clinical treatment of deafness. Such research centers would undoubtedly attract the keenest minds in

otology. It might even be possible to popularize the fight against deafness and to institute for this purpose another "March of Dimes."

REHABILITATION OF THE DEAFENED

The fact that deafness is not a deadly disease should be recognized as a good reason for the salvage and repair of persons with hearing defects. The deafened can find gainful employment more easily than the blind, but they fit themselves less smoothly into a normal social environment than those handicapped by other crippling diseases and infirmities. The rehabilitation of the deafened must be considered as a medical and social challenge of utmost importance; and only ignorance of the possibilities of social readjustment can lead to the misapprehension that institutions for the deaf are established for the purpose of ridding families of their handicapped and problematic members.

The observation has often been made that blind persons are, as a rule, of a happy and cheerful disposition. They frequently are vivacious and enthusiastic people of excellent social adjustment. Deafened persons, on the other hand, are not likely to present a similarly genial personality, unless they have received all possible medical treatment as well as guidance towards rehabilitation. Otherwise deafness will prove to be injurious and even ruinous to disposition and character, especially if the impairment begins in early life or develops to severe proportions. It takes a strong character indeed to overcome the trauma of deafness.

It has been the experience of the medical staff of the Armed Forces that the initial attitude of newly deafened patients is unfailingly negative. At first they will be downhearted and morose, profoundly hopeless, and completely uncoöperative. In almost every case it proved difficult to overcome the emotional barrier; yet only in this manner was it possible to guide the disabled veteran towards renewed participation in a normal life.

If a deafened child is to grow into adulthood without developing a marked inferiority complex accompanied by compensatory and reactive mechanisms, great intelligence, patience and the willingness to undergo special education will also be required on the part of the parents.

INFANTS AND YOUNG CHILDREN PRESENT DIAGNOSTIC DIFFICULTIES

It is most difficult to arrive at a diagnosis of deafness in an infant, or in a child under 4 or 5 years of age. If the child is totally or severely deafened, the parents may note that it sleeps in spite of loud noises in its immediate vicinity, or that it fails to respond when spoken to. But generally deafness will be suspected only if the child does not learn to talk, or articulates with a pronounced speech defect. As it is unable to hear, it is equally incapable of reproducing sounds correctly. All too frequently such children are judged by lay people and even diagnosed by physicians as mentally defectives. Institutions for the feeble-minded contain many children whose only defect is a hearing deficiency.

REPORT OF CASE

Case 1.—When I began my first year of teaching in public schools, my fellow teachers made it a point to advise me not to waste my time trying to teach little Jerry anything. They were unanimous in their judgment that Jerry was mentally defective and that he should be seated at the back of the class, and kept out of the way. After a month of sincere efforts to teach Jerry, I finally agreed with my fellow teachers. For the rest of the year Jerry sat at the back of the room and was again ignored. Needless to say, this boy had already developed into a social misfit with a distorted personality. His knowledge was inferior to that of the other children. Even his family agreed that Jerry was "dumb" and suggested not to waste too much attention on him. But when two years later routine hearing tests were given to the children of that school, poor Jerry was found to have struggled along under the handicap of a severe hearing deficiency. By that time, however, the feeling of inferiority had caused him to become a problem child.

COMMENT

Only a few weeks ago, a blind young lady of about 30 years of age came to my office for the treatment of a mild sinus infection. She was accompanied by her "seeing eye" dog. Everyone knows what an impressive sight such a pair make. Any blind person will attract attention and evoke pity and consideration. This young patient told me how valiantly her eye doctors had worked for months, trying to save her sight. Seven nationally and internationally famous eye specialists had been called into consultation on her case at the great eye clinic of the Presbyterian Medical Center in New York City. As an otologist it occurred to me that I have never witnessed an effort of comparable determination made in order to save a person's hearing.

Often it might almost seem as if the otologist would only begin to feel concerned about an ear disease, when the infection threatens to become fatal. In fact, a prominent otologist visiting Los Angeles a year or two ago made the remark which has already been quoted at the beginning of this article: "We do not operate because of deafness."

Any physician graduating from Medical School has but a limited understanding of the ear and the deafened patient. Unless he specializes in the field of otology, he is unlikely to learn much more on the subject; in fact, as time goes on he forgets part of his earlier knowledge. And even the otologist in his specialized training often learns little about deafness and the specific problems of the deafened as the emphasis placed upon the various problems is largely dependent on the interests of his teachers. Therefore, it is not surprising that, as a rule, otolaryngologists seem to find other branches of their specialty more interesting and otherwise attractive.

RECENT PREVENTIVE AND THERAPEUTIC MEASURES

Yet, in the last few years, an almost revolutionary change has taken place in the prevention and treatment of deafness. Dr. Julius Lempert has developed for the welfare of humanity one of the greatest, if not the greatest surgical interventions of the century giving the otosclerotic deafened improved hearing through the fenestration operation. But medical progress has also produced other methods designed to alleviate the sufferings of the deafened. It may, therefore, be useful to enumerate the various procedures which can find application in the treatment of deafness.

AN ENUMERATION OF POSSIBLE PROCEDURES

1. Nose drops—for the treatment of sinus infection, nasopharyngitis or inflammation and swelling of the eustachian tubes.

2. Sulfa drugs and penicillin (systemic)—for the systemic diseases which may cause deafness.

3. Tonsillectomy and adenoidectomy—especially adenoidectomy for the removal of adenoid tissue from the openings of the eustachian tubes.

4. Repeated adenoidectomy if indicated.

5. X-ray or radium treatment of the adenoid tissue blocking the entrance to the eustachian tubes.

6. External care for draining ears—dry wipes, swishes, aspirations and ear drops (sulfa drugs or penicillin).

7. Simple mastoidectomy.

8. Radical mastoidectomy.

9. Fenestration operation of Lempert, in case of otosclerosis.

10. Care and recommendations relative to general health—diet, environment, rest, etc.

11. Vitamins—especially vitamin B complex (but vitamins only if a vitamin deficiency exists. A well-balanced diet is preferable to synthetic vitamins).

12. Endocrine studies with special endocrine treatments if indicated.

13. Diagnosis of allergy and treatment if indicated.

14. Thorough checkup for foci of infection and their removal if found. In order of importance and frequency the foci of infection rank as follows: 1. Teeth; 2. Tonsils; 3. Sinus; 4. Miscellaneous (gall bladder, prostate).

15. Removal of noise trauma — noise whether high pitched, low pitched or mixed causes a high-toned, permanent nerve deafness.

16. Removal of any exogenous toxins, such as chemicals or other poisons at place of employment.

17. Removal of certain drugs that may cause deafness, such as quinine, salicylates.

18. Blood studies for syphilis, and treatment if indicated.

19. Diagnosis concerning intra-cranial tumors, and advice relative to surgery or treatment.

20. Establishment of possible malingering, and proper "treatment."

21. Determination of possible presence of hysteria, and proper "treatment."

22. Diagnosis of possible labyrinthitis (including Ménière's Syndrome) and treatment as indicated.

23. Explanation of handicaps of deafness to patient, parents, teachers and other associates, thus creating understanding, consideration and sympathy towards patient's possible abnormal reactions.

24. Discussion with patient, family and associates of abnormal social, psychologic and economic aspects of deafness.

25. Advice to deafened person to sit at the front of a school room or auditorium with the better ear towards the speaker.

26. Prescription of a hearing aid if necessary. The vacuum tube hearing aid is almost always preferable; bone conduction hearing aids should be prescribed only in rare instances.

27. Recommendation to study speech reading in a school for the deafened and to join a league for the hard-of-hearing.

28. Sustained and sympathetic interest in the patient's case, with due consideration of the psychological aspects of deafness and the depressing and introverting consequences of a hopelessly negative prognosis.

29. Advice and guidance of the patient relative to rehabilitation. Training schools are now being established, chiefly by the government for returning war veterans to teach them new and appropriate trades and skills.

30. Advice to the parents to beware of quacks.

31. Instruction to the patient and his relatives about the necessity of regular audiometric check-ups.

32. Routine audiometric hearing tests should be given each new patient seen by the otolaryngologist. Only in this way can early and obscure hearing losses be detected No examination of the ear, nose and throat is thorough or complete without an audiogram.

IN CONCLUSION

The choice of treatments and procedures from which the patient is likely to derive the greatest benefit will depend upon the characteristic features of each individual case. But the fact that such a large selection of methods has been evolved should dispel any notion that nothing can be done for deafness.

65 North Madison Avenue.

CONGENITAL ATRESIA OF THE ESOPHAGUS WITH TRACHEO-ESOPHAGEAL FISTULA*

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THE purpose of this communication is to review and further direct attention toward an anomaly of the gastro-intestinal tract, congenital atresia of the esophagus with tracheo-esophageal fistula. It is our wish to demonstrate the antemortum diagnostic roentgenographic findings and to show roentgenographically the pathologic anatomy as seen at necropsy.

Congenital artesia of the esophagus with tracheo-esophageal fistula is not a new entity, having been described in 1670, but it is an entity in which there has been a revived interest and a definite hope for cure with the advent of the present day scope of thoracic surgery and the newer chemotheraputic methods. This malformation produces a syndrome which involves both the digestive and respiratory systems, and in which, without intervention, the outcome is death. In this presentation, therapeutic triumphs cannot be stressed.

CLINICAL MATERIAL

In twenty months with 3,630 unselected deliveries, we have had two cases in full term, apparently normal, healthy infants following a normal pregnancy and delivery at a U. S. Naval Hospital dependent service. Brenneman[1] states that in his experience it is the most frequent congenital anomaly of the gastro-intestinal tract with the possible exception of hyperplastic stenosis of the pylorus, and Vogt[2] estimates approximately two cases in eight hundred and fifty infant hospital admissions. The statistics as regards frequency of congenital atresia of the esophagus vary widely. The reported cases number about four hundred, but undoubtedly more occur than are recognized.

DEVELOPMENT

In the development of the esophagus, the lower portion forms from the pregastric segment of the foregut. A more cephalic portion of the foregut gives rise to the upper esophagus and the entire epithelial mold of the respiratory tract. The tracheo-bronchial rudiment cleaves from the upper esophagus by means of two longitudinal lateral infoldings. With the approximation of the infoldings, the respiratory tract is formed and continues to develop and branch at its free end. This separation occurs early and is present by the end of two lunar months. The diverse malformations of the esophagus actually have a wide range running from entire involvement of the passage to regional involvement, and from agenesis to doubling. With particular reference to congenital esophageal atresias, Vogt classified them into three main groups and subdivided the third group into three subgroups. Vogt's Type 1 is the very rare complete esophageal absence. Type 2 is where both the upper and lower esophageal segments end blindly, and Type 3 is where an esophageal communication, or fistula, with the respiratory tract exists. In Type 3a the upper esophageal segment communicates with the trachea or a bronchus.

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